

**New species of bathyal and abyssal Sabellariidae
(Annelida: Polychaeta) from near New Caledonia
(southwest Pacific Ocean)**

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Abstract.—Specimens described in this work were collected during the BIOCAL and BIOGEOCAL cruises (Biology and Geology of New Caledonia) in 1985 and 1987 conducted by the Museum National d'Histoire Naturelle (Paris, France). All of the 488 specimens collected from depths between 440 m and 1870 m belong to the subfamily Lygdaminae Kirtley, 1994, which is characterized by the presence of four parathoracic segments. Among these specimens, we recognize four genera, including *Bathysabellaria* Lechapt & Gruet, 1993 with two species, a new species of *Lygdamis* Kinberg, 1867, two new species of *Phalacrostemma* Marenzeller, 1895, and a new species of *Tetreres* Caullery, 1913. All of these species are set apart from other known species by the shape of the outer and inner paleae and by their geographic and bathymetric distributions. These collections illustrate the uniqueness and richness of the polychaete fauna of the Sabellariidae of this Pacific area.

Except for the relatively limited accounts of Hoagland (1920:627), Treadwell (1926:191), Caullery (1944:54-66) from the Philippines and Indonesia, and that of Gibbs (1971:101-211) from the Solomon Islands, the benthic polychaete fauna from great depths of this geographic area remains poorly known, especially for the family Sabellariidae. The material on which this study is based was collected during the 1985 and 1987 cruises of the "Biology of New Caledonia" project, BIOCAL and BIOGEOCAL, respectively, conducted by the French National Museum of Natural History of Paris.

Specimens were collected with a Warentype rock dredge (Stations DW) or with a beam trawl (Stations CP), fixed in a seawater formalin solution and stored in 70% ethanol. The material was received from the Centre National de tri d'Océanographie

Biologique, Brest, France, examined under low power magnification and selected morphological features were studied by scanning electron microscopy (SEM). All type material is deposited in the National Museum of Natural History, Paris (MNHN).

Family Sabellariidae

Subfamily Lygdaminae Kirtley, 1994

The family Sabellariidae was subdivided by Kirtley (1994:14) into two subfamilies, the Sabellariinae with three parathoracic segments and the Lygdaminae with four parathoracic segments. All specimens considered here belong to the Lygdaminae, the genera being distinguished as follows:

- 1a. Compound (branched) feeding tentacles
..... *Lygdamis*
- 1b. Simple (unbranched) feeding tentacles 2
- 2a. Operculum completely divided
- *Phalacrostemma*
- 2b. Operculum not completely divided ... 3

† Deceased July 1997.

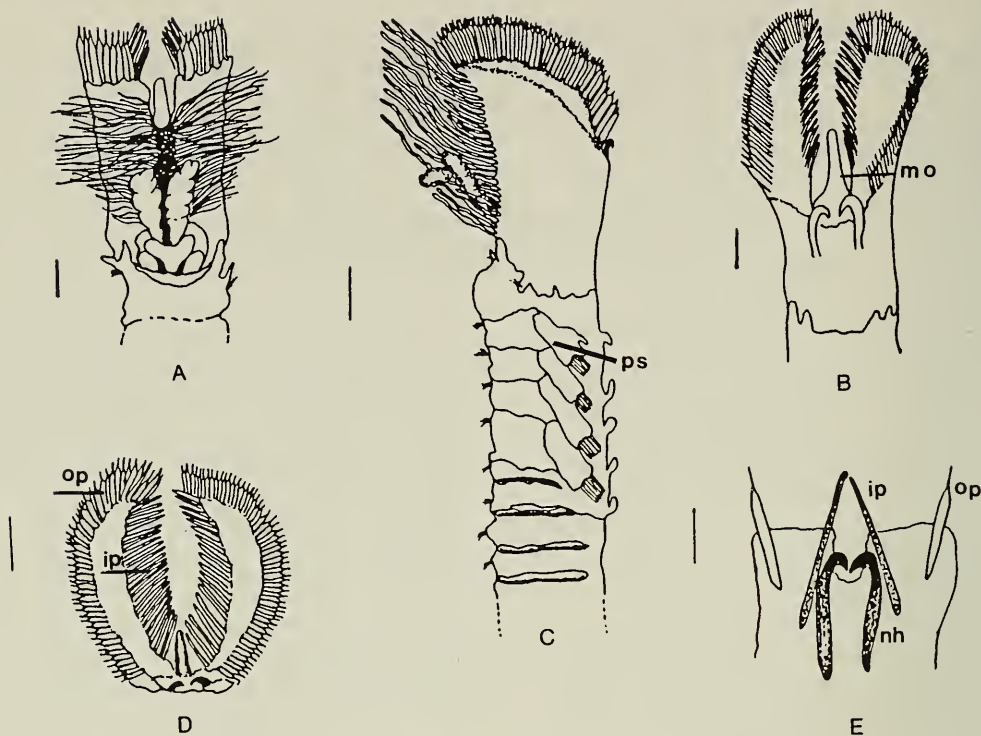


Fig. 1. *Lygdamis splendidus*, new species, (Holotype, MNHNP UC 356): A, ventral view of anterior end; B, dorsal view of anterior end; C, left lateral view; D, surface view of crown; E, cross-sectional diagram showing position of paleae and nuchal hooks on crown. Scale bars = 1 mm. Abbreviations: ip = inner paleae, mo = median organ, nh = nuchal hook, op = outer paleae, ps = parathoracic setiger.

- 3a. Operculum completely fused along ventral margin *Bathysabellaria*
 3b. Operculum with deep indentation along ventral margin *Tetreres*

Genus *Lygdamis* Kinberg, 1867
Lygdamis splendidus, new species
 Figs. 1, 2

Material examined.—Southwest off New Caledonia, BIOCAL cruise, station DW 66, 24°55'S, 168°21'E, 515 m, 3 Sep 1985, Holotype (MNHNP UC 356), Paratypes (MNHNP UC 357) (two specimens).

Description.—Holotype incomplete, missing posterior most segments and cauda; total length 13 mm, thoracic diameter 3 mm. Anterior end of opercular stalk completely divided into bilaterally sym-

metrical lobes (Fig. 1A, B). Opercular paleae of two kinds, in curved, dorsoventral rows (Fig. 1C, D). Outer paleae, 100–120 in number, 2 mm long, transparent, smooth, with distal ends terminating in fine tips (Fig. 2A, C); inner paleae, 36–40 in number, 3 mm long, yellow-gold, smooth, with slightly curved tips (Fig. 2B, D). Falcate dorsal nuchal hooks, tips recurved inward toward dorsal midline (Fig. 1E). With well-developed median organ arising from dorsal sagittal suture between opercular lobes (Fig. 1B). Twenty-five pairs of compound feeding tentacles on ventral margins of each side of opercular peduncle, pair of short prehensile prostomial tentacles arising from anterior margin of upper lip of stoma. Large U-shaped building organ with conical lobes on lat-

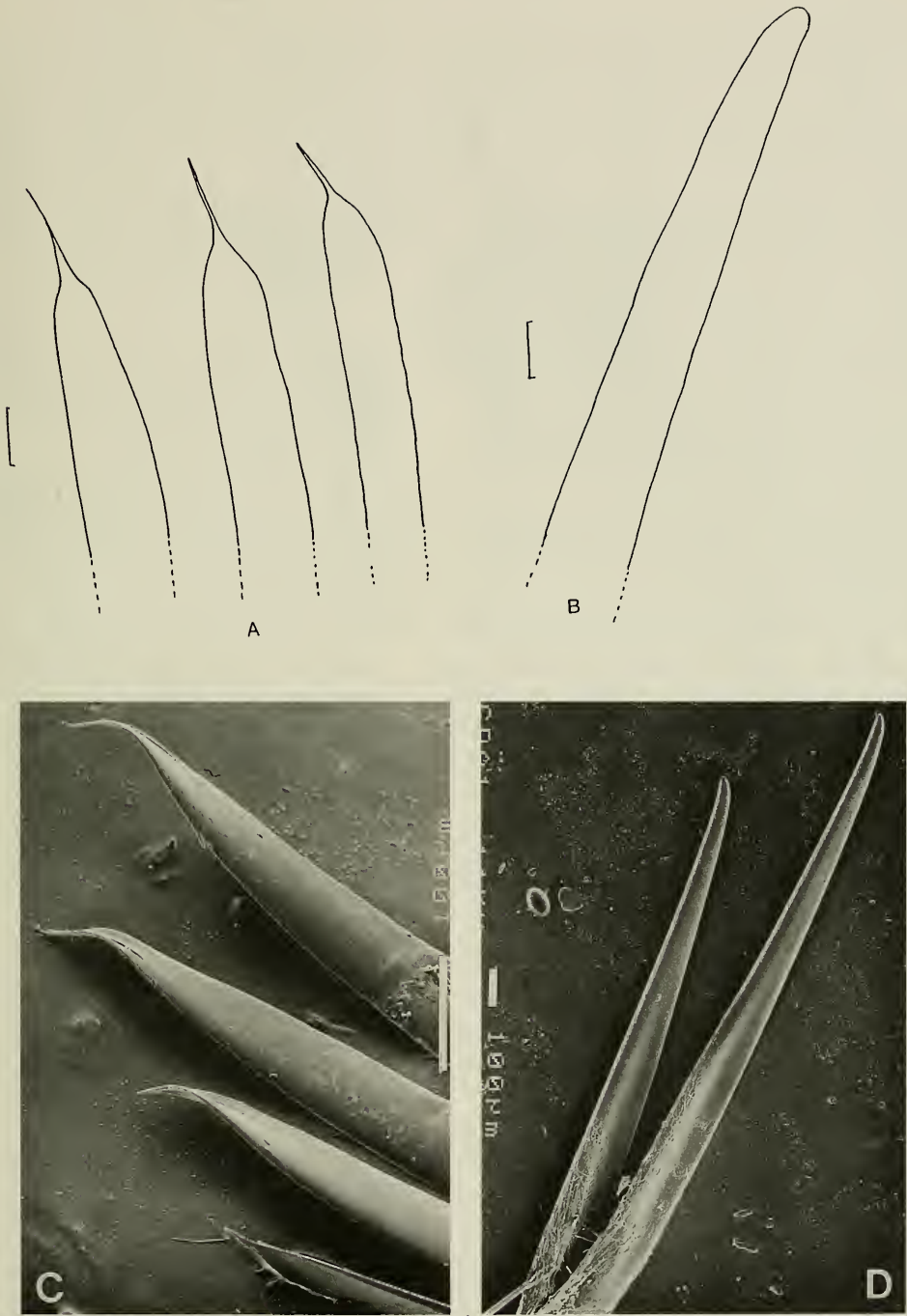


Fig. 2. *Lygdamis splendidus*, new species, (Holotype, MNHNP UC 356): A, outer paleae; B, inner paleae; C, SEM of outer paleae; D, SEM of inner paleae. Scale bars = 0.1 mm for A, B and 100 μ m for C, D.

eral margin, with conical cirrus with small bundle of short, ventral, finely serrate capillary setae. Setiger 2 with same bundle of finely serrate capillary setae. Four parathoracic segments (Fig. 1C) with small cirri on distal dorsal margin of notopodial sheaves; 7-8 paired, stout setae with lanceolate distal tips and spinous, capillary companion setae with curved tips in transverse row on each notopodial sheave. Neuro-podial setae similar, but smaller in size and fewer in number. Dorsal branchiae on parathoracic segments. Abdominal segments with bundles of long, spinous neurosetae and uncinigerous notopodial tori. Cauda not observed. No tubes.

Etymology.—The specific name, from Latin *splendidus* = magnificent, refers to its very beautiful appearance.

Remarks.—*Lygdamis splendidus* is clearly distinguished from other species of *Lygdamis* by the shape of the outer paleae, tapering to fine distal tips, the shape of inner paleae, and total number of paleae; moreover, of all *Lygdamis* species, *L. splendidus* occurs at the greatest depth. *L. indicus* Kinberg, 1867 and *L. gilchristi* (McIntosh, 1922) appear to be most similar to *L. splendidus* but differ in the shapes of the inner and outer paleae and by their geographical and bathymetric distributions (Fig. 3).

Key to the species of *Lygdamis* [after Kirtley (1994:117-118)]

- 1a. Outer paleae with smooth lateral margins 4
- 1b. Outer paleae with lateral margins not smooth 2
- 2a. Outer paleae with serrate lateral margins, with slightly concave inner surfaces (A, Fig. 3) (West Africa, 77 m) *L. robinsi*
- 2b. Outer paleae with lateral margins not serrate 3
- 3a. Outer paleae with complex ornamentation, with irregular, wavy, transverse lines across middle portion of blade, inner paleae with fine, marginal decoration (B, Fig. 3) (West Africa, 22 m) *L. kirkegaardi*
- 3b. Without complex ornamentation on outer paleae 4
- 4a. Distal ends of outer paleae straight, nearly bilaterally symmetrical 5
- 4b. Distal ends of outer paleae curved, conspicuously asymmetrical 8
- 5a. Outer paleae with narrow distal spines terminating in narrow, delicate spike; nuchal hooks with weakly recurved tips (C, Fig. 3) (Indonesia, 36 m) *L. indicus*
- 5b. Outer paleae with distal tips tapering to very long spike; nuchal hooks with strongly recurved tips; inner paleae with slightly curved tips (D, Fig. 3) (New Caledonia, 515 m) *L. splendidus*, new species
- 5c. Outer paleae converge slowly to sharp tips; inner paleae converging abruptly to symmetrical short, sharp tip (E, Fig. 3) (South Africa, 75 m) *L. gilchristi*
- 6a. Outer paleae with blade margins almost parallel through middle portion, terminating in narrow mucronate tips; inner paleae with gently bent tips (F, Fig. 3) (Australia, 70 m) *L. augeneri*
- 6b. Outer paleae narrowing continuously from middle portion to tips 7
- 7a. Distal ends of outer paleae slightly asymmetrical; inner paleae with bent distal ends; nuchal hooks strongly recurved, with sharp tips (G, Fig. 3) (Australia, 64 m) *L. giardi*
- 7b. Outer paleae moderately expanded through middle portion and tapering slowly to sharp distal point; inner paleae tapering slowly to dull point; nuchal hooks with strongly recurved sharp tips (H, Fig. 3) (England) *L. muratus*
- 8a. Outer paleae with distal tip as flat projection from cylindrical paleal blade 9
- 8b. Outer paleae with distal tip as cylindrical continuation of paleal blade 12
- 9a. Middle portion of outer paleae expanded, distal ¼ constricted and slightly curving (I, Fig. 3) (Madagascar) *L. malagasiensis*
- 9b. Distal ¼ of outer paleae not abruptly constricted 10
- 10a. Distal tip of outer paleae very narrow, rounded at distal end of blade, with elongate, sigmoidal spike; inner pale-

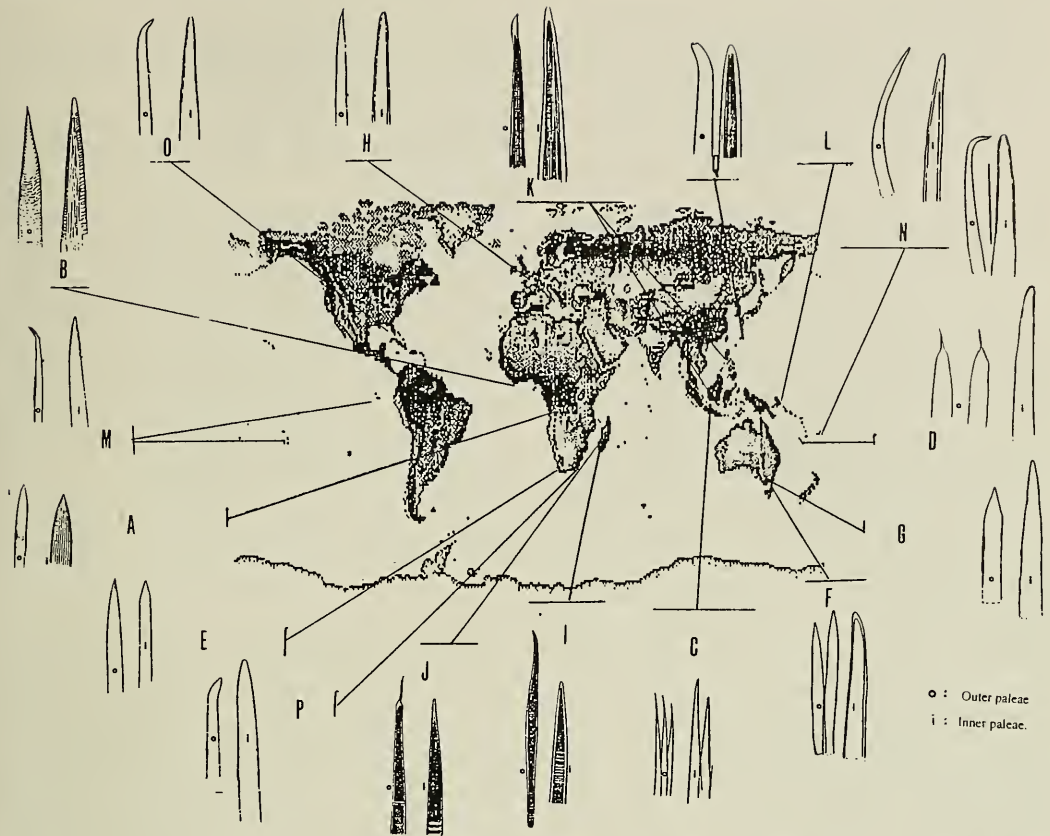


Fig. 3. Shapes of outer paleae and inner paleae of species of the genus *Lygdamis* with geographical observations. A = *L. robinsi*, B = *L. kirkegaardii*, C = *L. indicus*, D = *L. splendidus*, new species, E = *L. gilchristi*, F = *L. augeneri*, G = *L. giardi*, H = *L. muratus*, I = *L. malagasiensis*, J = *L. bhaudi*, K = *L. ehlersi*, L = *L. gibbsi*, M = *L. nesioties*, N = *L. laevispinis*, O = *L. rayrobertsi*, P = *L. dayi*, Q = *L. curvatus*.

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|--|---|
| <p>ae with narrow tips (J, Fig. 3) (Madagascar) <i>L. bhaudi</i></p> <p>10b. Distal tip of outer paleae without sigmoidal spike 11</p> <p>11a. Outer paleae with narrow, curved distal tip (K, Fig. 3) (Indonesia, Philippines, 45 m) <i>L. ehlersi</i></p> <p>11b. Outer paleae with wide, curved distal tip; tip of nuchal hook bent about 90° from axis of shaft (L, Fig. 3) (Solomon Islands, coral reef) <i>L. gibbsi</i></p> <p>12a. Distal tips of outer paleae conical, sigmoidal in outline 13</p> <p>12b. Distal tips of outer paleae not sigmoidal in outline 14</p> <p>13a. Outer paleae with sigmoidal tip, curved inward about 30° from vertical</p> | <p>axis of shaft toward center of crown; nuchal hooks very large, strongly bent to blunt tips (M, Fig. 3) (East Pacific Ocean, coral reef) <i>L. nesioties</i></p> <p>13b. Outer paleae with sigmoidal tip, curved inward about 80° from vertical axis of shaft toward center of crown; nuchal hooks relatively small, strongly bent, short, stout, with sharp tip (N, Fig. 3) (South Central Pacific Ocean) <i>L. laevispinis</i></p> <p>14a. Tip of outer paleae with stout, short abruptly pointed tips; nuchal hooks elongate, large, strongly bent (O, Fig. 3) (Florida, Gulf of Mexico, 328 m) <i>L. rayrobertsi</i></p> <p>14b. Tips of outer paleae short, blunt 15</p> |
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- 15a. Inner paleae with fine transverse markings (P, Fig. 3) (South Africa) . . . *L. dayi*
 15b. Inner paleae stout, tapering to dull point; outer paleae with stout, rounded tips (Q, Fig. 3) (Bonin Islands)
 *L. curvatus*

Genus *Phalacrostemma* Marenzeller, 1895
Phalacrostemma tenue, new species
 Figs. 4, 5

Material examined.—Southeast off New Caledonia, BIOCAL cruise, station CP 62, 24°19'S, 167°48'E, 1395 m–1410 m, 2 Sep 1985, Holotype (MNHNP UC 358), Paratypes (MNHNP UC 359) (two specimens).

Description.—Holotype 4 mm long; diameter of opercular crown 1.5 mm. Anterior end of opercular stalk completely divided into two bilaterally symmetrical halves (Fig. 4A, B). Each side of crown with 16–17 outer paleae; 2–3 inner paleae in dorsal position. Outer paleae with transverse striations and expanded distal margins, with regular distal denticles forming fringe (Figs. 4C, 5A, B). Inner paleae smooth, tips blunt with regularly spaced transverse ridges (Fig. 4D). Two nuchal hooks on each side of anterior dorsal midline of stalk, each curving to an acute tip.

Robust median organ arising from between dorsal inner margins of stalk. Pair of long prehensile prostomial tentacles arising from anterior margin of upper lip of stoma, with 4 simple, ciliated feeding tentacles on each side of buccal cavity.

First setiger with bundle of ventral pectinate capillary setae. Second setiger with conical cirrus with bundles of pectinate setae. Four parathoracic segments, each with neuropodial sheaves of setae with pectinate distal margins; notopodial sheaves with 5–7 setae with oar-shaped denticulate and acute distal tips, with companion capillary setae. Eight abdominal setigers with bundles of long, slender and spinous capillary neurosetae, and uncinigerous notopodial tori, uncini with 7–8 teeth in double row. Lacking cauda. No tubes.

Paratypes 4 mm long with three abdomi-

nal setigers. Only two inner paleae on right side of stalk, 18 outer paleae on left side of stalk.

Etymology.—The specific name, from Latin *tenuis* = thin, refers to its very small size.

Remarks.—*Phalacrostemma tenue* is closely related to *P. lechapti* Kirtley, 1994, formerly described as *P. cidariophilum* Fauvel, 1914 (not Marenzeller, 1895), but the arrangement of spinous fringes on the outer paleae and the parathoracic notosetae (Table 1) clearly distinguish these two abyssal forms, one from the Atlantic (Fauvel 1914: 273), the other from the Pacific.

Phalacrostemma profundum, new species
 Fig. 6

Material examined.—Loyauté Basin, zone Z2, BIOGEOCAL cruise, station CP 317, 20°48'S, 166°53'E, 1630 m, 2 May 1987 (one specimen); off southwest Lifou, zone SB2, BIOGEOCAL cruise, station CP 265, 21°04'S, 167°04'E, 1870 m, 18 Apr 1987 (two specimens with tubes), Holotype (MNHNP UC 360), Paratype (MNHNP UC 362); off southwest New Caledonia, zone SB5, BIOGEOCAL cruise, station CP 214, 22°44'S, 166°28'E, 1665 m, 9 Apr 1987 (one specimen), Paratype (MNHNP UC 361).

Description.—Holotype 12 mm long, including opercular crown; diameter of opercular crown 2 mm, thoracic diameter 1.8 mm. Short opercular stalks well divided into two symmetrical halves with outer paleae 2 mm long (Fig. 6A, B). Each half of crown with 30–40 outer paleae spirally arranged, some paleae moved backward in relation to external row. These outer paleae tapered, ringed, without spinous ornamentation (Fig. 6D, E). Along dorsal edge of each crown, 2–3 yellow, smooth, inner paleae with distal apex slightly curved (Fig. 6C). Crown margins with 13–14 long bifid pericoronal palpi. Four pairs of curved dorsal hooks. A small median organ present between dorsal inner margins of stalk. Pair of large, deeply

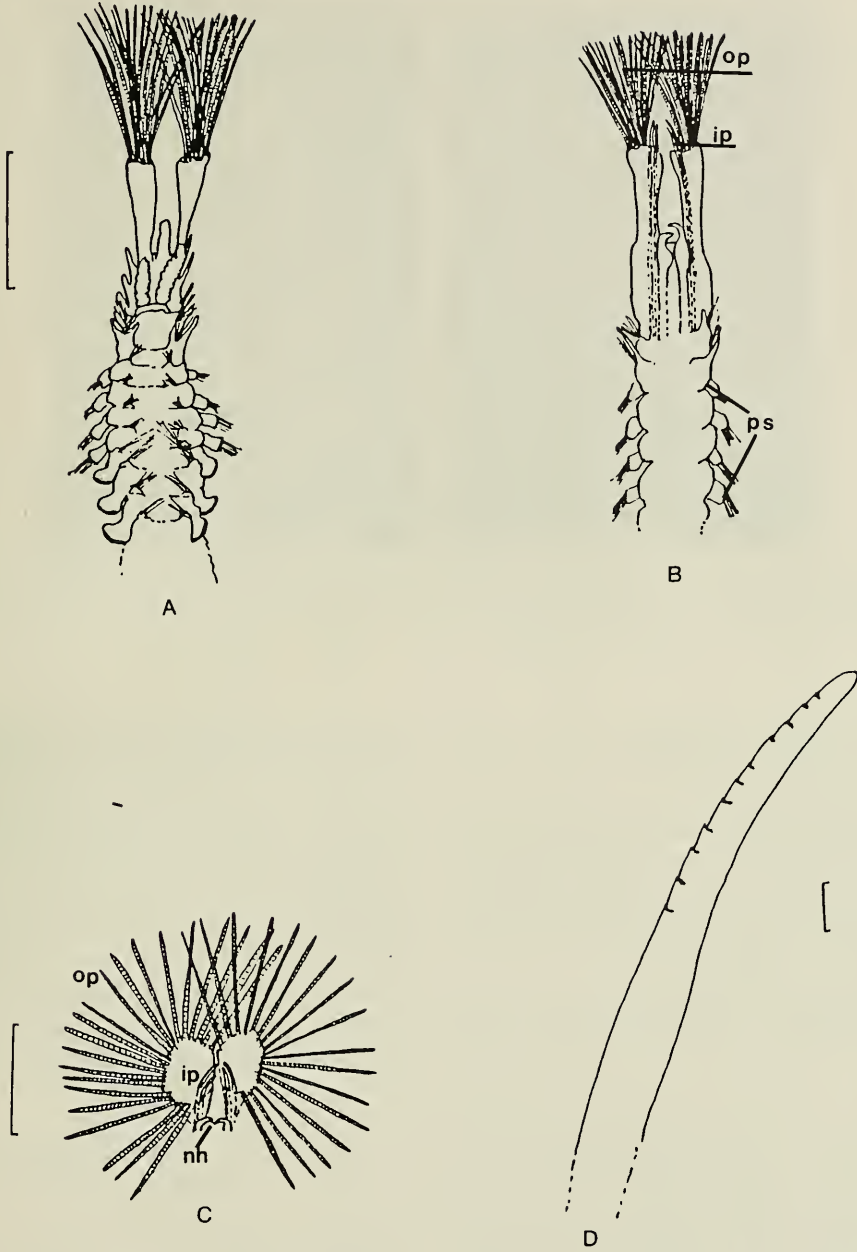


Fig. 4. *Phalacrostemma tenue*, new species, (Holotype, MNHNP UC 358): A, ventral view of anterior end; B, dorsal view of anterior end; C, surface view of crown; D, inner paleae. Scale bars = 1 mm for A-C and 0.1 mm for D. See Fig. 1 for key to abbreviations.

grooved, peristomial tentacles arising from anterior margin of stoma. Four feeding tentacles on each anterior lateral margin of buccal cavity. Large glandular, U-shaped build-

ing organ with marginal bundles of short spinous capillary setae. Setiger 2 with bundles of spinous capillary setae and short triangular cirri.

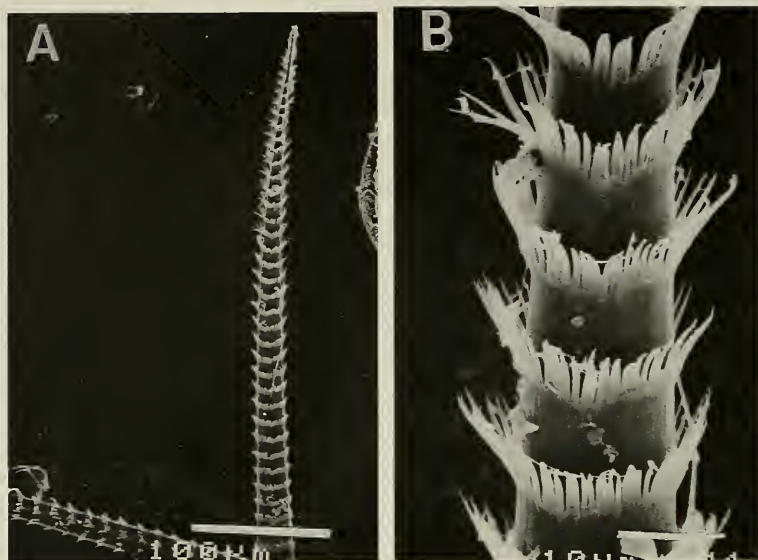


Fig. 5. *Phalacrostemma tenue*, new species, (Holotype, MNHNP UC 358): A, SEM of outer paleae; B, SEM of outer paleae magnified. Scale bars = 100 μm for A and 10 μm for B.

Four parathoracic segments with slightly spinous neuropodial capillary setae and bundles of 6–7 tapering bristly notopodial setae with smooth capillary companion setae. Abdominal segments with spinous capillary neurosetae, notopodia with comblike uncini with 8–9 rows of teeth. Cauda absent. Tubes composed of sand grains.

Etymology.—The specific name, from the Latin *profundus* = deep, refers to the great depths from which it occurs (1720 m on average).

Remarks.—*Phalacrostemma profundum*, new species, is distinguished from *P. cidariophilum* Marenzeller, 1895 and from other species of this genus by the smooth outer paleae and the shape of the inner paleae and by its geographical distribution (Table 1).

Genus *Bathysabellaria* Lechapt & Gruet, 1993

Characteristics of this genus include an opercular stalk completely fused; blades of outer paleae broad, stout, inner surfaces slightly concave, terminating in acuminate

tips, blades with basal transverse ridge, rotated around longitudinal axis of shafts; inner paleae twice as long as outer paleae, inner surface slightly concave, outer surfaces expanded, gently curved toward center of crown, with 3–4 simple, small, filamentous ciliated feeding tentacles on each side of buccal cavity; two relatively small preoral tentacles; nuchal spines straight, cylindrical, with very slightly curved distal tips; four parathoracic segments (Lechapt & Gruet 1993).

Bathysabellaria neocaledoniensis












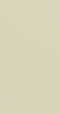
Lechapt & Gruet, 1993

Fig. 7

Material examined.—Southwest Pacific Ocean: off New Caledonia, BIOCAL cruise, stations DW 44, 22°47'S, 167°14'E, 440 m–450 m, 30 Aug 1985, 24 specimens, DW 77, 22°15'S, 167°15'E, 440 m, 3 Sep 1985, one specimen.

Description.—Opercular paleae of two kinds: outer paleae in concentric row along anterior periphery of crown surface, 28 in number, bright yellow-gold, smoothly ta-

Table 1.—Some characteristics of species of *Phalacrostemma* Marenzeller, 1895.

SPECIES	Characteristics of outer paleae	Aspect of outer paleae	Number of outer paleae	Characteristics of inner paleae	Geographic occurrence	Depth sampling
<i>P. abyssalis</i>	Kirtley, 1994 With short distal fringe with simple ornamentation		10	no data	Flores Sea (Indonesia)	794 m
<i>P. cidariophilum</i>	Marenzeller, 1895 Smooth distal margins slightly inclined from horizontal		8	Flattened, straight tips	Adriatic, Mediterranean	485 m–1298 m
<i>P. dorothvae</i>	Kirtley, 1994 Thecae of middle part of blade with short finely denticulate fringe forming crescentic distal margin		no data	Irregular, slightly inflated thecae with distal margins	Florida	350 m
<i>P. gloriæ</i>	Kirtley, 1994 Thecae of middle portion with shorter and fewer denticles with slightly undulatory horizontal trace		no data	Thecae well developed with distal margins producing zig-zag pattern	Gulf of Mexico	230 m
<i>P. gwendolynae</i>	Kirtley, 1994 Distal fringe with expanded distally attenuate distal extension		no data	no data	Caribbean Sea	228 m
<i>P. lechanti</i>	Kirtley, 1994 Distal of outer paleae with irregularly distally expanded rows of alternately wide and narrow marginal extensions, with both long and short, pectinate, distal tips		no data	With conspicuous thecae and with deep groove along proximal median portion	Azores	880 m–1440 m
<i>P. paulinae</i>	Kirtley, 1994 Distal portion with expanded distal regular denticles forming distal fringes		no data	no data	West Atlantic	2160 m
<i>P. perkinsi</i>	Kirtley, 1994 Middle portion without distinct dentition and very weakly expanded distal margins		no data	no data	Bahamas Islands	1360 m
<i>P. setosa</i>	(Treadwell, 1906) Distal portion without conspicuously expanded, with distal margins forming horizontal zig-zag pattern.		no data	no data	Hawai Islands	300 m–700 m
<i>P. tenera</i>	(Augener, 1906) <u>Incomplete description</u>		no data	no data	Barbados	365 m
<i>P. profundum</i>	this work Tapering, ringed without spinous ornamentation		30/40	Smooth with distal portion lightly incurved	Off New Caledonia	1700 m
<i>P. tenue</i>	this work Longitudinal striations and expanded distal margins with regular distal denticles forming fringes		16/17	Smooth blunted tips with regularly spaced transverse markings	Off New Caledonia	1400 m

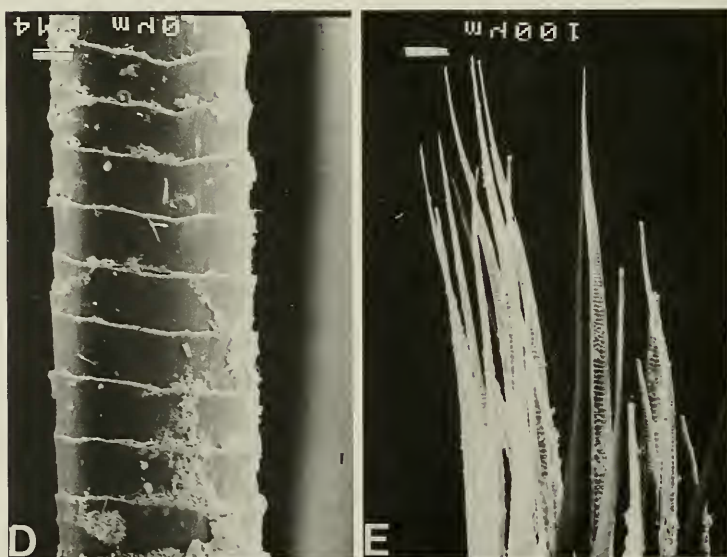
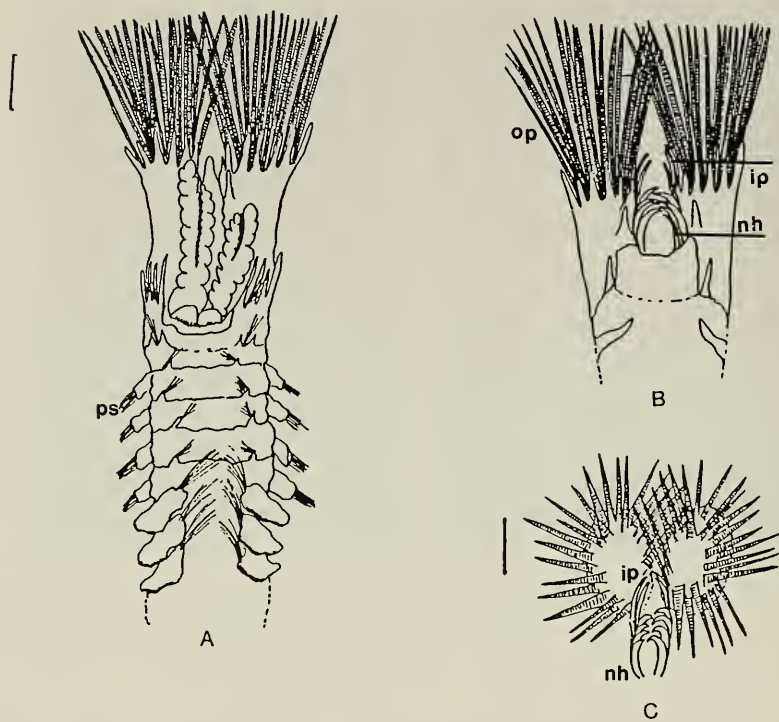


Fig. 6. *Phalacrostemma profundum*, new species, (Holotype, MNHNP UC 360): A, ventral view of anterior end; B, dorsal view of anterior end; C, surface view of crown; D, SEM of outer paleae magnified; E, SEM of outer paleae. Scale bars = 1 mm for A-C, 10 μ m for D and 100 μ m for E. See Fig. 1 for key to abbreviations.

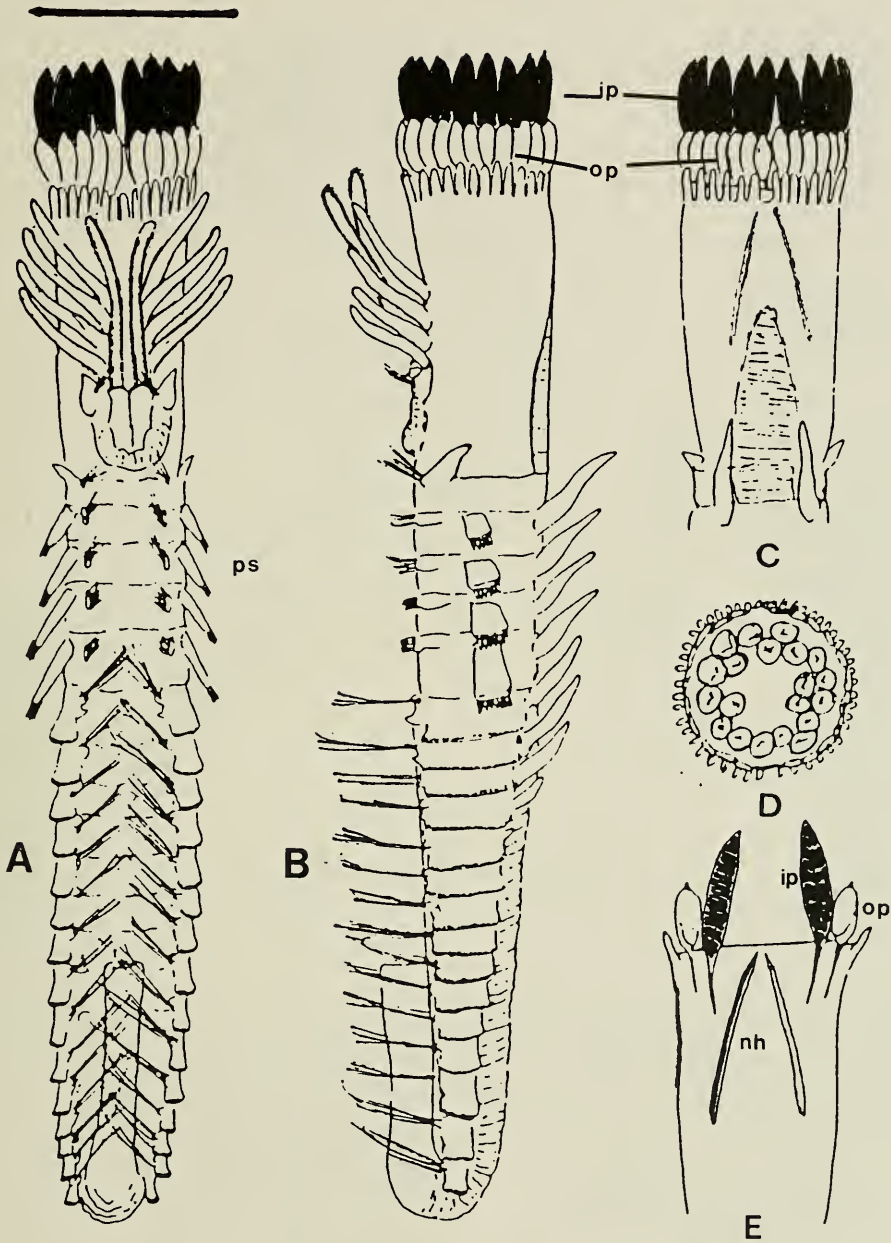


Fig. 7. *Bathysabellaria neocaledoniensis*: A, ventral view; B, left lateral view; C, dorsal view of anterior end; D, view of anterior surface of crown; E, cross-section of anterior end of crown showing position of opercular setae and nuchal spines. Scale bar = 2 mm. See Fig. 1 for key to abbreviations.

pered distal margin, and frayed or broken tips; inner paleae in single irregularly crowded row, 11 in number, erect, twice as long as outer paleae (Fig. 7A-E); blades inflated, terminating in slightly bent, mucro-

nate tips, with basal concavity and numerous fine transverse serrations, with simple pair of golden, acicular nuchal spines on each side of dorsal midline of opercular stalk.

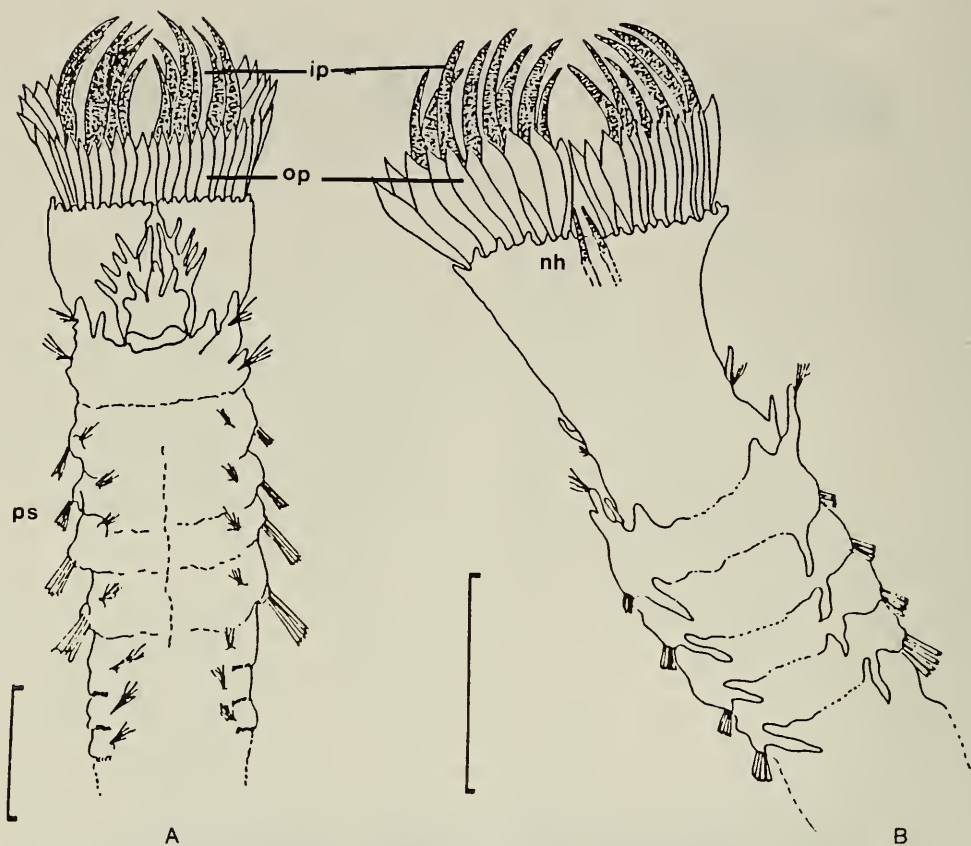


Fig. 8. *Bathysabellaria spinifera*: A, ventral view of anterior end; B, dorsal view of anterior end. Scale bars = 1 mm.

Agglutinated tubes composed of small sand grains and *Globigerina* tests.

Remarks.—Known only from the localities reported herein.

Bathysabellaria spinifera

Lechapt & Kirtley, 1996

Fig. 8

Material examined.—Off New Caledonia, BIOCAL cruise, stations DW 36, 23°08'S, 167°11'E, 650 m–680 m, 29 Aug 1985, 11 specimens; DW 33, 23°10'S, 167°10'E, 675 m–680 m, 29 Aug 1985, 3 specimens; DW 46, 22°53'S, 167°17'E, 570 m–610 m, 30 Aug 1985, 145 specimens; DW 51, 23°05'S, 167°45'E, 680 m–700 m, 30 Aug 1985, 287 specimens and MUSOR-

STOM IV cruise (N/O *Vauban*), station DW 222, 22°57'S, 167°33'E, 410 m–440 m, 30 Sep 1985, 2 specimens.

Description.—Opercular crown with two kinds of paleae: outer paleae bright yellow, blades smoothly tapered, with fine serration, 33–51 in number in various specimens and disposed in a complete circle around periphery of crown without any interruption or ventral indentation (Fig. 8A, B); inner paleae golden brown, arranged in two or three concentric rings, not in a spiral whorl; blades spiniform, distally curved, with inflated base and numerous fine serrations, one or two short inflated paleae inserted between long curved paleae, 20–30 in external row, 10 to 20 in the internal row. Two

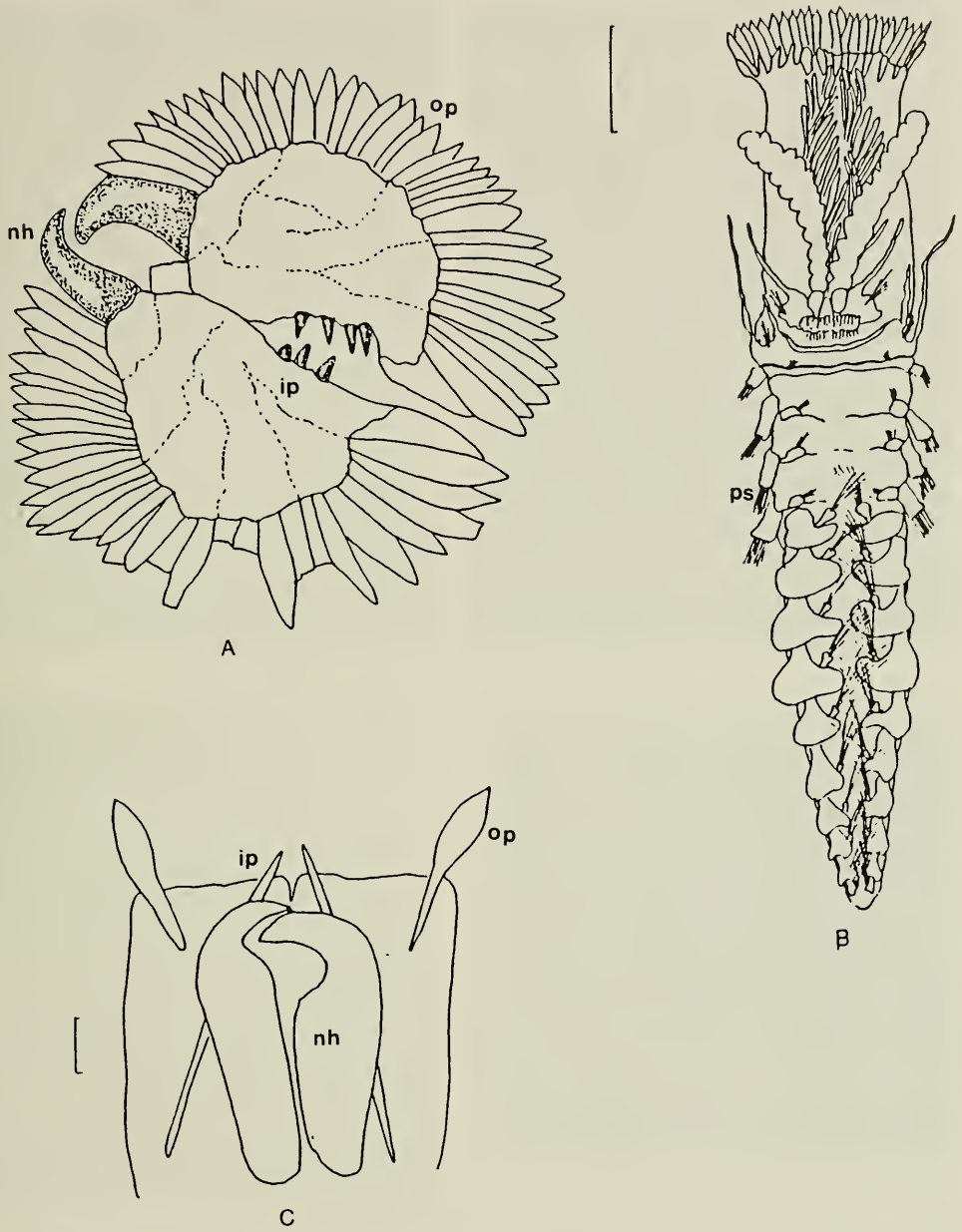


Fig. 9. *Tetreres robustus*, new species. (Holotype, MNHNP UC 363): A, view of surface of crown; B, ventral view; C, cross-section of anterior end of crown showing position of opercular setae and nuchal spines. Scale bars = 1 mm for A, C and 10 mm for B.

straight, golden, cylindrical, acicular nuchal spines with slightly curved distal tips on each side of the dorsum of the opercular stalk.

No tubes were sampled.

Remarks.—*Bathysabellaria spinifera*, only from the localities reported herein (Lechapt & Kirtley 1996), is characterized by a greater number of individuals (400 specimens) and a wider bathymetric distribution

than the other species of the genus, *B. neo-caledoniensis*.

Genus *Tetreres* Caullery, 1913
Tetreres robustus, new species
Figs. 9–10

Material examined.—Southeast off New Caledonia, BIOCAL cruise, stations DW 44, 22°47'S, 167°14'E, 440 m–450 m, 30 Aug 1985, 2 specimens (Holotype MNHNP UC 363); DW 77, 22°15'S, 167°15'E, 440 m, 5 Sep 1985, 5 specimens (Paratypes MNHNP UC 365); blocks with burrows inside (UC 364).

Description.—Holotype 35 mm long with 19 setigers (incomplete specimen). Thoracic diameter 8 mm, opercular crown 8 mm in diameter. Opercular stalk partially divided along dorsal midline (Fig. 9A). Outer paleae, 70–80 in external series, yellow gold, smooth, with distally spatulate blades (Figs. 9A, B, 10A, B); inner paleae, 3–4 on each side, parallel to midline of crown, 6 mm long (Figs. 9A, 10D). Pair of large dorsal nuchal hooks bent outward at right angles to longitudinal axis of blades and shaft with tips pointing inward toward prostomium (Figs. 9C, 10C).

Opercular stalk with 25–30 long, conical papilli; relatively short peristomial tentacles, 12 in number, and 2 long paired lateral lips. Building organ with accessory setigerous cirri on each side. Series of 4 elongate, triangular cirri along either side of setiger 2; inferior cirri with tiny bundles of fine, spinous capillary setae. Four parathoracic segments with fin-like notopodia, each with 7–9 stout setae with lanceolate tips and companion capillary setae. Neuropodia with similar setae, fewer in number (4–6), with pair of dorsal branchiae on each parathoracic segment.

Abdominal segments with neuropodial cirri with bundles of long capillary setae, some long, smooth capillary setae, and strongly spinous capillary setae. Notopodial uncini with 8–9 teeth in double rows.

All specimens were collected inside bur-

rows of 6–7 mm in diameter, in large blocks made of *Globigerina* tests (UC 364).

Etymology.—The specific name, from the Latin *robustus* = robust, refers to its great size.

Remarks.—*Tetreres robustus*, new species, is characterized by the number and shape of the outer paleae and belongs to the group of species whose outer paleae possess elongate, flattened blades.

Key to the species of *Tetreres*

- 1a. Outer paleae with elongate flattened blades 2
- 1b. Outer paleae without flattened blades 4
- 2a. Nuchal hooks with short distal tips (Indian Ocean, 896 m) *T. sandraae*
- 2b. Nuchal hooks with long distal tips 3
- 3a. Blades of outer paleae with attenuate distal spike 8
- 3b. Blades of outer paleae without attenuate distal spike 6
- 4a. Cylindrical outer paleae with distal prolongation 5
- 4b. Cylindrical outer paleae without distal prolongation (Indonesia, 330 m) *T. superbus*
- 5a. Distal tip of outer paleae short, flattened, with filiform plume (Philippine Islands, 1470 m) *T. philippinensis*
- 5b. Blades of outer paleae short, flattened, without filiform distal tip (Antarctica, 3803 m) *T. maryriceae*
- 6a. Blades of outer paleae taper abruptly to slightly flattened tip 7
- 6b. Blades of outer paleae taper gradually to acute tip 8
- 7a. Blades of inner paleae with internal fusiform outline (Western Atlantic, 4825 m) *T. varians*
- 7b. Blades of inner paleae without internal fusiform outline (Hawaiian Islands, 589 m) *T. baileyae*
- 8a. Margins of blades of outer paleae almost parallel 9
- 8b. Margins of blades of outer paleae not parallel 10
- 9a. Outer paleae with acute extended tip (Antarctica, 4758 m) *T. cassidyi*
- 9b. Outer paleae with dyssymmetrical acute tip (Southeast Pacific Ocean, 440 m) *T. robustus*, new species

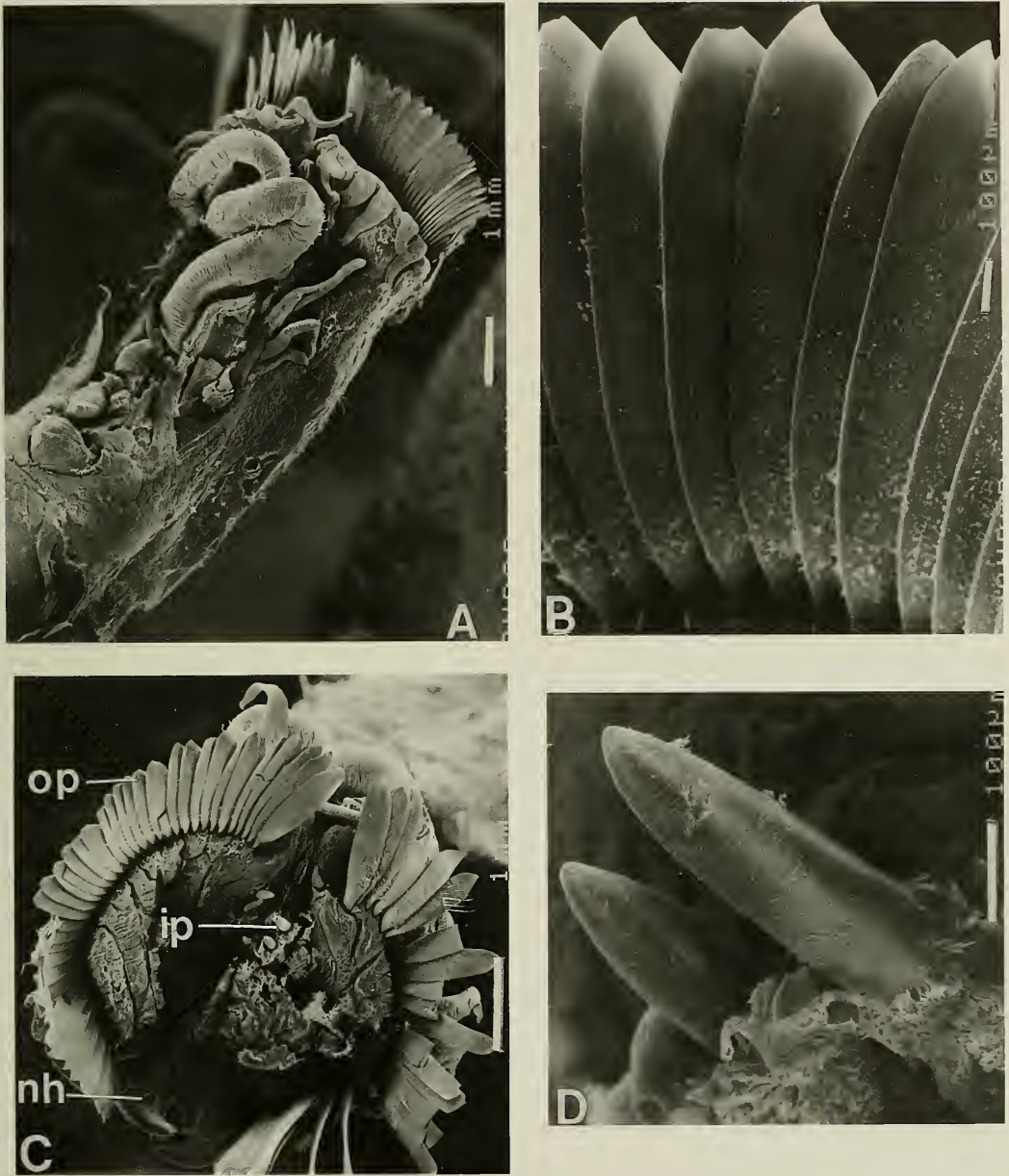


Fig. 10. *Tetreres robustus*, new species, (Holotype, MNHNP UC 363): A, SEM of anterior end; B, SEM of outer paleae; C, SEM of surface of crown; D, SEM of inner paleae enlarged. Scale bars = 1 mm for A, C and 100 μm for B, D. See Fig. 1 for key to abbreviations.

- 10a. Margins of blades of outer paleae wide through distal one-half (East Central Pacific Ocean, 3850 m)*T. jirkovi*
- 10b. Margins of blades of outer paleae wide through middle portion, with conspicuous transverse thecal bands

across surface (Northwest Atlantic Ocean, 4825 m)*T. perryi*

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